

INSTITUTE OF GENETICS AND SELECTION OF
MICROORGANISMS (MOSCOW)

(Currently in the Atomic Energy Commission - A new
Institute under construction to be occupied in
about one year.)

DIRECTOR: Dr. S. I. Alikhanian

500 workers in 24 laboratories

Main Groups:

Genetics of industrial microorganism
Molecular genetics
Chemistry
Biochemistry
Biophysics
Biopolymers

The main purpose of this Institute is to study

- a. fundamental and applied problems
- b. meet the demands of the industrial sector
- c. study genetics as applied to molecular
biology (productive strains)
amino acid production
enzymes - cellulase, and proteases
antibiotics
vitamins (especially B₁₂)

The organisms under investigation in this Institute are:

<u>B. subtilis</u>	phages T ₄ and
<u>E. coli</u>	yeasts: <u>S. ceriviseas</u> ,
<u>Actinomycetes</u>	<u>Candida</u>
Actinophages	

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The Specific Projects are:

1. Actinomycetes and Actinophages

Recombination in Actinomycetes
special interest in tetracycline

Transduction

They have the first genetic way for phage attachment.

Prophage not as yet mapped. They presently have a lysogenic strain which provides a good model system.

2. Bacteriophage T₄

Studies on mechanism of suppression and
nonsense mutation.

Hope this will be useful for industrial micro-organisms.

3. Molecular genetics

Studies on mutagenes on T₄ phage. Regulation
of recombination

Effect of neighboring nucleotide on mutagenesis

4. Bacterial genetics in E. coli

Studies on regulatory mechanisms (especially
thymine regulation)

Concentration on deoxynucleoside operon

Catabolic effects for thymidine phosphatase,
aldolase, deoxyribose 5' phosphatase,
phosphodeoxymutase, but no effect on
thymidine kinase.

Results are similar to those published by Prichard(England)

Overall interest - integration of control processes.

5. Genetic Engineering

Model system is T₄ phage.

Studies with conditional lethal mutants. In course
of these experiments have found several new genes.
(R, star 1, 2, 3).

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5. (cont'd)

Star 3 similar to gene described by Dr. Josilith. Interested in getting integration of bacterial DNA into phage. For example, wish to put penicillinase gene of B. subtilis into E. coli.

6. Fungi and yeast

Radiobiology study - effect of ionizing radiation to study ploidy. Apply to industrial strains. Newly organized unit - currently collecting strains. Wish to study hydrocarbon utilization - and its genetic control. Later to study Aspergillus. This group was not very impressive.

7. Biochemical Genetics

Study of recombination in B. subtilis (as initiated by Dr. Clark in California). Selection of mutants with changes in enzyme level. Have mapped ATP dependent DNA one. Now searching for specific transducing phages.

8. Amino Acid producing strains.

Selecting mutants and physiological conditions

Brevibacterium

Corynebacterium

B. subtilis

E. coli

Transformation, phage transductive, and mutant selection (nitrosoguanidine) attempted in Corynebacterium. Concluded lysine, tryptophan, isoleucine, glutamic acid are not economical for synthesis - objects for study.

Auxiliary group in Armenian found in corynebacterium

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8. (cont'd)

B. thuringensis

9. Exoenzymes

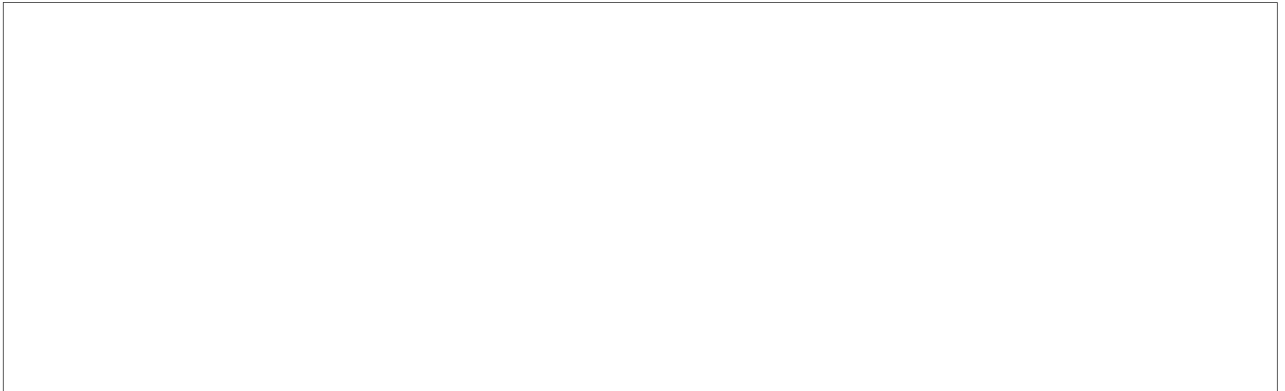
Aspergillus - acid protease

Trichoderma - cellulase

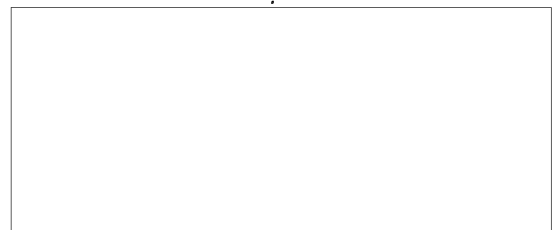
B. subtilis - serine protease

Pseudomonas - lipase

Attempting to improve production.



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